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August 31, 2012
Via Email and U.S. Mail

Dana Bayuk
Department of Environmental Quality
2020 Southwest Fourth Avenue, Suite 400
Portland, Oregon 97201-4987

Re: Agreement to Construct Groundwater Source Control Extraction System and Performance Monitoring Network, NW Natural, Gasco Site, Portland, Oregon

Project Number: 000029-02.26, 5A

Dear Dana:

Thank you very much for DEQ's conditional approval to construct the Gasco alluvium water bearing zone hydraulic control and containment (HC&C) system and performance monitoring network, as expressed in DEQ's August 9, 2012 letter, *Revised Groundwater Source Control Measures Construction Design Report*.

NW Natural agrees to DEQ's statements and conditions, which are described on pages 1 and 2 of the letter and repeated verbatim as follows:

1. *Inform NW Natural that after the results of the final extraction well design steps are submitted to DEQ and following our review and approval, the overall final design of the Alluvium water-bearing zone (WBZ) hydraulic control and containment (HC&C) system will be complete and construction can proceed. The final extraction well design steps include:*
   - *Updating the groundwater model and using it to evaluate the HC&C system operating under two reasonable worst-case scenarios representative of seasonal ranges in site-specific groundwater conditions; and*
   - *Finalizing the designs of the remaining upper Alluvium WBZ extraction wells.*

2. *Notify NW Natural that DEQ approves the control wells, piezometers, observation wells, and monitoring wells included in the groundwater source control performance monitoring network subject to our replies to NW Natural's November 4th responses and comments to the Construction Design Report, including:*

   - *Adding two piezometers (PZ7-100 and PZ9-110) to the network;*
   - *Constructing observation wells in the Fill WBZ so the bottom of the screened intervals are located at the top of the upper silt unit;*
   - *Equipping monitoring wells WS-8-33, WS-8-59, and WS-12-161 with transducers to assess the limits of the hydraulic influence of the Alluvium WBZ hydraulic control and containment (HC&C) system to the southeast;*
   - *Placing downhole temperature and specific conductance probes in piezometers in the PZ2 and PZ8 clusters and the upper three piezometers in the PZ-7 and PZ9 clusters; and*
   - *Providing documentation on the applicability of the pre-packed monitoring well sump seals for use at the site.*

NW Natural has accepted the bullet conditions under Item 2, as modified in the next paragraph. Cascade Drilling Co. is scheduled to begin construction of the performance monitoring network on September 17. NW Natural plans to begin constructing the HC&C system after receiving DEQ approval of the two bullet items listed under Item 1. Cascade Drilling Co. is scheduled to begin construction of the HC&C extraction wells on September 24.

There are four comments in DEQ's August 9 letter that directly affect the construction of the performance monitoring and HC&C system. These four items were discussed in the August 20 meeting with DEQ and for clarification purposes are further discussed in this letter.

The first item is the method for sealing the annulus of the monitoring wells specified in Item 2, Bullet 5. Instead of using the pre-packed monitoring well sump seals, NW Natural will use bentonite chips installed using a method similar to the method approved by DEQ for the extraction wells. It is NW Natural's understanding from discussions during the August 20 meeting that both DEQ and the Oregon Water Resources Department approve this method.

The second item is DEQ's request to add a Tar-specific Green Optical Screening Tool (TarGOST) boring, as stated on page 6 of the August 9 letter (see the following request).

Task 2 – Baseline DNAPL Mobilization Monitoring TarGOST® Borings: This task is complete except as indicated by DEQ. Consistent with the Baseline Monitoring Work Plan and with DEQ's approval, NW Natural completed the baseline TarGOST® borings at extraction well locations PW-2U, PW-3U, PW-5U, PW-6U, and 14U. That said, observations made during push-probe drilling at the remaining upper Alluvium WBZ extraction well locations indicate TarGOST® logging should also be conducted at the PW-11U location prior to the initial operation and testing of the HC&C system.

As discussed during the August 20 meeting, NW Natural agrees to add a TarGOST boring at the PW-11U location. During the meeting we also requested that the PW-11U TarGOST boring be installed as part of the next scheduled round of multiple TarGOST borings, to avoid the extraordinary unplanned cost that would be incurred by mobilizing out of state drilling and testing equipment for just one boring. We understand that this schedule is acceptable to DEQ.

The third item is DEQ's comment regarding sources of uncertainty, shown as follows from page 8 of the August 9 letter:

HC&C System Operations and Performance Criteria: *Many of NW Natural's Category 1 and Category 2 responses recommend selecting HC&C system operational and performance criteria based on "transient" groundwater modeling. NW Natural proposes performing transient modeling following construction and initial testing of the HC&C system and during preparation of the Operations Design Report. DEQ approved NW Natural's transient modeling proposal in the July 18, 2012 e-mail transmitting our comments on Appendix F (Model Documents) of the Construction Design Report. In addition, DEQ acknowledges and accepts NW Natural's proposal to develop and select specific operational parameters (e.g., H value, limits on extraction well pumping rates) and performance criteria (e.g., horizontal and vertical gradients needed to minimize DNAPL mobilization while hydraulically controlling and containing groundwater in the Alluvium WBZ) based on the data collected during initial operations/testing of the HC&C system. However, DEQ does not approve constructing the HC&C system without additional information on how the information needed to develop and select operational parameters and performance criteria will be indentified and evaluated.*

The general approach to conducting initial operations and testing phase of the HC&C system is described in Section 3.2.2 of the Construction Design Report. DEQ requests that NW Natural supplement Section 3.2.3 with information that:

- *Identifies sources of uncertainty associated with the data to be collected during the initial operations/testing phase and used for purposes of developing and selecting HC&C system operational parameters and performance criteria*
- *Describes how the uncertainties will be addressed or evaluated during testing.*

As indicated in DEQ's general comments to the Revised Interim Design Report, NW Natural's presumption that during Segment 2 pilot well tests groundwater level changes and gradient changes observed between pre-pumping and pumping periods were due entirely to the influence of extraction wells could lead to overestimating the effectiveness of the HC&C system. DEQ's request is intended to address this comment by identifying potential factors unrelated to the extraction wells and evaluating their potential influence during the initial operations/testing. Processes that influence water level measurements (e.g., measurement error in transducers and electronic water level sensors) and/or cause water level fluctuations (e.g., river stage fluctuations, river stage changes) represent sources of uncertainty for data collection during initial testing.

DEQ believes identifying sources of uncertainty and developing approaches for evaluating them during testing will focus data collection objectives relevant to long-term HC&C system operations and is necessary for the initial operations/testing phase to be successful.

In the August 20 meeting Anchor QEA expressed concern about the uncertain amount of time that it could take to identify and reach agreement with DEQ on how the uncertainty factors will be handled during testing and future monitoring of the system. In NW Natural's view resolution of the uncertainty factors does not affect the design of the components of the extraction system. Therefore, at the meeting Anchor QEA proposed that these uncertainty factors be investigated and resolved between NW Natural and DEQ during the period of construction of the HC&C system. We understand that DEQ agrees with this approach.

The fourth item is in regard to DEQ's recommendation on the bottom of page 10 of the August 9 letter, which is shown as follows:

Category 1, Comment 12, Section 1.3. NW Natural did not respond to DEQ's comment indicating extraction wells should be constructed so as not to restrict uplands remedial actions (e.g., excavation removal). Extraction wells are located in the vicinity of additional SCMs (e.g., Fill WBZ interceptor trench) and/or remedial actions (e.g., riverbank removal, replacement, stabilization; sheet-pile vertical barrier) that will or could be constructed along the same length of

shoreline. Consequently, there is the potential for future construction work to compromise the installations. DEQ recommends constructing the wells to increase their structural stability (e.g., completing extraction wells with oversized large-diameter concrete seals which extend through the fill into the upper Alluvium). This is an item requiring resolution before extraction wells are constructed. NW Natural should be advised measures may need to be taken to protect existing extraction wells during construction to prevent damage.

Based on discussion during the August 20 meeting, NW Natural's understanding is that DEQ and the Oregon Water Resources Department now prefer that temporary structural support be applied to selected wells, if necessary, during future remedial actions and no longer consider the installation of oversized concrete seals. NW Natural agrees that temporary structural support may be needed during future remedial actions.

NW Natural further understands that DEQ does not require the January 31, 2012 *Revised Groundwater Source Control Measures Construction Design Report* to be revised and resubmitted. Regarding DEQ's various requests in the August 9 letter to revise figures and tables, those revisions will be provided in the Operations and Performance Monitoring Design Report or the Construction Completion Report.

During the August 20 meeting, DEQ clarified that its approval for NW Natural to build the HC&C system and the performance monitoring network is conditioned only upon resolution of the specific items discussed and clarified in this letter. We request that DEQ confirm in writing that the above clarifications to the conditional approval are acceptable to DEQ.

By accepting the DEQ conditions stated above for construction of the HC&C system and the performance monitoring network, NW Natural is not agreeing to the remainder of the comments and statements in DEQ's August 9 letter. In the near future, NW Natural will provide a detailed response to the comments and statements in DEQ's August 9 letter, following which we can meet to discuss any issues on which we continue to disagree.

We are very pleased to have reached this milestone for the Gasco site, and we thank you again for making the decisions we needed to get here.

Sincerely,

Bob Wyatt
NW Natural

cc: Patty Dost, Pearl Legal Group
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